Dellar Trust

**RESPONSE TO RWQCB EMAIL**
**October 29, 2009**

1. We have revised Specification Section 2222 – Earthwork and Waste Relocation to better match the intent of the final cover re-grading at the Dellar Landfill site. The final surface of the landfill area will be graded at a minimum of 3 percent slope by relocating existing waste within the landfill area and by adding soil fill, where needed to meet the final grades. The resulting final cover surface will have from 1 to 6 feet of soil compacted as described in the specifications. See attached specifications.

2. The monitoring wells in the 28th Street Landfill monitoring program are proposed for monitoring of the Dellar Property. A separate section of the report would be dedicated to the Dellar Property that will specifically discuss the results of the monitoring points near the Dellar site in terms of historic trends and comparison to other wells in the 28th Street monitoring program. All other elements of the groundwater monitoring program specified in the CAO are met through the 28th Street program, including background monitoring points and other criteria such as required COCs.

   1.h.iii Groundwater background monitoring. As outlined in the 28th Street Landfill monitoring program.

   1.h.iv Groundwater corrective action monitoring. As outlined in the 28th Street Landfill monitoring program.

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DIVISION 2 - SITEWORK

## DIVISION 2 – SITE WORK

## SECTION 02110

## CLEARING AND STRIPPING

### PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: The Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required for site clearing work. The Contractor shall not disturb more than (35) acres of surface area at any one time during the project without prior approval from the City.

B. General: Site clearing work shall include removal of surface debris and other plant life required and for bringing the site to final grade. Vegetation in areas to be stripped shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing.

C. Work Specified Elsewhere:

1. Section 02222 Excavating and Grading

1.2 DEFINITIONS

A. Clearing: Clearing shall consist of removing vegetation, including trees and brush, and debris that exists within the construction limits.

B. Stripping: Grasses and top soil shall be removed from the work area as shown on the Drawings and as specified herein. This material shall be stockpiled in a designated area and reapplied after completion of the final cover as specified.

C. Permits: The Contractor shall obtain all permits necessary for removal of vegetative growth within the work area.

1.3 QUALITY ASSURANCE

A. All materials and labor furnished under this section shall comply with ASTM, AA, NEC, ANSI and all other applicable Federal, State and City codes and regulations including revisions to date of contract.

B. Coordinate Clearing Work with utility companies.

**PART 2 - PRODUCTS** (Not Applicable)

## PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that existing plant life designated to remain is clearly tagged and/or identified.

B. Identify an appropriate waste/salvage area for placing removed materials. The waste/salvage area shall be approved by the City prior to placement of materials.

3.2 PROTECTION

A. Locate, identify and protect existing utilities from damage.

B. Protect trees, plant growth and features designated to remain, as final landscaping by encircling the trees with protective fencing.

C. Protect bench marks, survey control point, wells, and existing structures from damage or displacement.

3.3 CLEARING

A. Clear areas required for site access and execution of the Work.

B. Remove trees and shrubs within marked areas. Remove stumps, main root ball and root system to a depth of 12 inches.

C. Clear undergrowth and deadwood, without disturbing subsoil.

3.4 TOPSOIL STRIPPING

A. Strip approximately 3 inches of topsoil from the work areas, without mixing with foreign materials.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 20 feet and protect from erosion.

D. Place excess topsoil not intended for reuse on denuded areas at a location on site, as approved by the City.

3.5 DUST CONTROL

The CONTRACTOR shall be responsible for controlling objectionable dust by his/her operation of vehicles and equipment during all land disturbing activities. The Contractor shall use methods, subject to the CQA Office's approval, that keep dust in the air to a

minimum and to the satisfaction of the City. Dust control will be particularly important in controlling the migration of waste particles containing lime, cement, metals, silt, and sand during the re-grading of the landfill slopes and top deck.

END OF SECTION

## SECTION 02221

## EXCAVATION AND GRADING

### PART 1 - GENERAL

1.1 SUMMARY

A. Section includes excavating soil and rock as required.

B. Related Sections

1. Section 02110 – Clearing and Stripping

2. Section 02222 – Earthfill and Waste Relocation

1.2 DEFINITIONS

A. Construction Quality Assurance (CQA) Consultant: The monitoring firm responsible for implementation of the CQA plan.

### PART 2 - PRODUCTS

2.1 NO PRODUCTS ARE REQUIRED FOR EXCAVATION.

### PART 3 - EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Provide for dust control.

C. Provide dewatering as necessary.

3.2 EXCAVATION AND GRADING

A. Excavation and Grading includes cover, roads, and drainage ditches.

B. Strip surfaces of work area of vegetation or other organic material prior to grading the foundation layer soil. Place stripped vegetation and soil in designated stockpiles on Drawing No. 2.

C. Excavate to the limits of work lines and grades shown on the Drawings.

D. Remove lumped subsoil, boulders, and rock over 6 inches in largest dimension from completed area of the cover surface.

E. Notify County of unexpected subsurface conditions and discontinue work in affected area.

F. Exercise care to preserve materials below and beyond the lines of grading. Excavation performed for the convenience of the Contractor will be at no additional expense to the City. Place earthfill in over-excavated areas per Section 02222.

G. Exercise care to preserve existing environmental control systems by hand digging to expose wells, piezometers, risers, etc., so as not to damage said item, especially during grading operations.

3.3 WASTE EXCAVATION AND HANDLING

A. The Contractor may encounter waste during excavation and uncovering of the edge of existing cover system. In the event that waste is encountered, it shall be excavated and disposed at the active working face of the landfill as directed by the City.

B. The Contractor shall prepare and utilize a site-specific Health and Safety Plan to prevent associated hazards, as specified in Section 01010.

END OF SECTION

## SECTION 02222

## EARTHFILL AND WASTE RELOCATION

### PART 1 - GENERAL

1.1 SUMMARY

A. Section includes placement of on-site soils as earthfill and relocation of waste to create revised grades.

B. Related sections.

1. Section 02221 - Excavation and Grading

1.2 REFERENCES

A. American Society for Testing and Materials.

1. D 422-63 (7/84), Standard Test Method for Particle-Size Analysis of Soils.

2. D 1557-91, Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-LB (4.54 KG) Hammer and 18-in (457-mm) drop.

3. D 2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.

4. D 2922-81, Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods.

5. D 3017-78, Test Method for Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods.

1.3 DEFINITIONS

A. Backfill: Material placed in previously excavated trenches.

B. Cohesionless Materials: Materials classified by the Unified Soil Classification System (USCS) as GW, GP, SW, and SP.

C. Cohesive Materials: Materials classified by USCS as GC, SC, ML, CL, MH, and CH.

D. Earthfill: On-site soil, obtained from on-site excavation, that is placed to specified densities and moisture contents.

E. Lift: One single continuous placement of soils, usually measured in inches of depth.

F. Percent Relative Compaction: Field dry density expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D 1557-91.

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G. Waste: Waste is defined as non-soil materials relocated in the landfill during re-grading.

**PART 2 - PRODUCTS**

2.1 EARTHFILL

A. Sources: On-site stockpiles and on-site borrow areas as shown on the Drawings.

B. Free of organic or other deleterious material.

C. Maximum particle size of 4 inches in largest dimension

**PART 3 - EXECUTION**

3.1 GENERAL

A. Identify required lines, levels, contours, and datum.

B. Provide for dust control.

C. Provide for surface water control.

3.2 SUBGRADE PREPARATION

A. Strip surfaces in the work area of vegetation or other organic material. Stripped material will be stockpiled in a location identified by the County per Section 02221, 3.2B.

B. Grade the exposed surface per Section 02221. Place and compact additional soil fill per this Section.

C. CQA Monitor will observe prepared surfaces before earthfill placement.

D. Relocate waste and compact with minimum of two pass of a sheepsfoot compactor.

3.3 EARTHFILL

A. Earthfill shall be placed to smooth existing surfaces to achieve the cover system's re-graded surface. The CQA Monitor shall observe the Contractor and verify grades.

Deleted: Foundation Layer

Deleted: foundation layer thickness meets the 2 foot minimum thickness.

B. Place soil and waste to the lines and grades shown on the drawings.

C. Scarify top of each compacted lift before placing subsequent lift, unless sheepsfoot or padfoot compactor is utilized.

D. Maintain soil moisture content within specified range.

E. Moisture condition, recompact, or remove and replace soil not meeting specified requirements as determined by the County or authorized representative.

F. Place and compact as specified in Tables 02222-1.

G. Testing will be performed as specified in Table 02222-2.

**Table 02222-1**
**Foundation Layer**
**Placement and Compaction Requirements**

| Fill Type | Loose[1] Lift Thickness (inches) | Moisture Content[2] | Minimum Subgrade and Lift Density | Method of Test | Finished Grade Tolerance[3] (feet) |
|---|---|---|---|---|---|
| Earthfill | 8-in maximum | 5% below optimum to 5% above optimum | 90.0% minimum | ASTM D 1557 | -0.1 to +0.1 |

(1) Thinner lifts may be required to obtain adequate compaction.
(2) Moisture limits may have to be adjusted to obtain required density or to minimize desiccation cracking.
(3) Provided adequate drainage is maintained.

Deleted: Foundation

Deleted: Layer

**Table 02222-2**
**Foundation Layer Testing Frequency**

| Test Method ASTM No. | Foundation Layer On-Site |
|---|---|
| Conformance Testing | |
| D1557 | 5,000 cy/ |
| D422 | 5,000 cy/ |
| D2487 | 5,000 cy/ |
| D5084 | |

| Field Testing | |
|---|---|
| D2922 | 500 cy/ |
| D1556 | 5,000 cy/ |

Frequency/ Number of Tests = 1,000 cy/ 10

3.4 FIELD QUALITY ASSURANCE

A. The City will engage and pay for the services of: (1) CQA Consultant; and (2) CQA Laboratory.

B. Contractor shall render assistance as necessary for CQA Consultant to obtain soil and material samples.

C. CQA Consultant will determine maximum dry density and optimum moisture content.

D. CQA Consultant will determine in-place density and moisture content.

E. Cooperate with City or authorized representative in scheduling and performing field CQA tests.

END OF SECTION

# SECTION 02226

# GEOTEXTILE FABRIC

## PART 1 - GENERAL

### 1.1 DESCRIPTION

A. This section covers the work necessary to furnish and install woven geotextile fabric required by the Drawings and Specifications.

B. The work includes furnishing all labor, supervision, tools, construction equipment, and materials necessary to install the fabrics described by these Drawings and Specifications.

### 1.2 GENERAL

A. Provide all labor, materials, and equipment necessary to accomplish the work specified in this section.

### 1.3 REFERENCES

A. Reference Standards: The following standards, including documents references therein, are referenced within this section and form part of this section to the extent designated herein. Unless otherwise specified, the most recent version of the reference standards at the bidding shall apply.

B. American Society of Testing and Materials:

1. ASTM D885, Methods of Testing Industrial Filament Yarns Made from Man-Made Fibers.

2. ASTM D1777, Method for Measuring Thickness of Textile Materials.

3. ASTM D3776, Test Methods for Mass Per Unit Area (Weight) of Woven Fabric.

4. ASTM D3786, Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics.

5. ASTM D4491, Test Methods for Water Permeability of Geotextiles by Permittivity.

6. ASTM D4533, Test Method for Trapezoid Tearing Strength of Geotextiles.

7. ASTM D4632, Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).

1.4 DEFINITIONS

A. Satisfactory Materials: Materials which comply with the requirements of this Section are satisfactory.

B. Unsatisfactory Materials: Materials which do not comply with the requirements of satisfactory materials are unsatisfactory.

1.5 SAFETY

A. The Contractor shall be solely responsible for installing geotextiles in a safe manner. Provide appropriate measures to ensure that persons working on or near the project area are protected.

B. Contractor shall familiarize themselves with, and comply with, all applicable codes, ordinances, statutes, and bear sole responsibility for the penalties imposed for noncompliance.

1.6 SUBMITTALS

A. Prior to delivery, submit certificates of compliance with the requirements and testing methods specified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Geotextile shipped during the wet weather period shall be shipped in a closed trailer.

B. Geotextile shall be protected from precipitation, inundation, ultraviolet exposure, dirt puncture, cutting, and other damaging or deleterious condition.

**PART 2 - PRODUCTS**

2.1 EQUIPMENT

A. Furnish all necessary equipment required to accomplish the construction of the road base aggregate and erosion protection layers.

2.2 NON-WOVEN GEOTEXTILES

A. The non-woven geotextile supplied by the Contractor shall be:

1. A non-woven, needle-punched, staple fiber or continuous filament polyester material, or

2. A non-woven, needle-punched, staple fiber or continuous filament polypropylene material.

Geotextile shall be UV-light resistant.

B. Geotextile shall meet performance criteria and shall be approved by the CQA Officer.

PERFORMANCE CRITERIA

| Fabric Property | Unit | Test Method | Woven |
|---|---|---|---|
| Grab Strength | Lb | ASTM D4632 | 135 |
| Trapezoid Tear | Lb | ASTM D4533 | 45 |
| Puncture Strength (5/16") | Lb | ASTM D3787 | 70 |
| Mullen Burst | Psi | ASTM D3786 | 265 |
| Vert. Water Flow 2" head | $Gpm/ft^2$ | ASTM D4491 | 4 |
| Coef. Of Perm. K | cm/sec | ASTM D4491 | 0.06 |
| AOS (Apparent Opening Size) | Sieve Size | ASTM D4751 | 40 |
| UV Resistance (500 hr.) | % | ASTM D4355 | 90 |

C. The Manufacturer shall mark on each roll the Manufacturer's name, product identification, lot number, roll number, and roll dimensions.

D. The Manufacturer shall test one sample, consisting of five specimens, per each lot. One random thickness test per roll shall also be performed. The Contractor shall submit all test information and samples prior to the material being received on site.

2.3 WOVEN GEOTEXTILES

A. The woven geotextile supplied by the Contractor shall be:

1. A woven, continuous filament polyester material, or

2. A woven, continuous filament polypropylene material.

B. Geotextile shall meet performance criteria and shall be approved by the CQA Officer.

C. The Manufacturer shall mark on each roll the Manufacturer's name, product identification, lot number, roll number, and roll dimensions.

D. The Manufacturer shall test one sample, consisting of five specimens, per each lot. One random thickness test per roll shall also be performed. The Contractor shall submit all test information and samples prior to the material being received on site.

**PART 3 - EXECUTION**

3.1 DEVELOPMENT

A. Geotextile is to be deployed following the Manufacturer's recommendations, standards, and guidelines.

B. The geotextile is to be secured against movement caused by wind. Securing mechanism must be left in place on geotextile until replaced with protective soil cover material.

C. Geotextile laying and subsequent covering with gravel, soil, road base aggregate and erosion layers shall proceed in such a manner as to minimize exposure to light.

D. The surface to receive the geotextile shall be smooth, free from obstructions, depressions, and sharp objects. Notify the CQA Monitor prior to placing geotextile so that the CQA Monitor may observe the surface to receive the geotextile. Lay geotextile so as to minimize the number of joints and seams.

Lay geotextile loosely, but without creases.

E. Do not operate machinery directly on the geotextile. When placing material over joints, place in the direction from the overlying geotextile to the underlying geotextile. Prevent puncture, tear, or displacement of geotextile and protect from damage.

3.2 SEAMING

A. Seams for the geotextile shall be overlapped sewn seams for the geotextile shall be overlapped to provide a "prayer" seam, "J" seam, or "butterfly" seam and shall

be a two-thread, double-lock switch, Federal Class No. 1. Heat bonded seams for the non-woven filter geotextile shall be overlapped a minimum of 1 foot. Seams shall be continuous.

B. Polymeric thread shall be used in sewing with properties equal to or greater than those of the geotextiles.

3.3 REPAIRS

A. Repair holes or tears in the geotextile by fabric patch placed over the repair area overlapping undamaged geotextile by 1 foot. Patch should have dimensions at least 1 foot greater than the tear or hole.

B. Replace roll when tear exceeds 10 percent of roll width.

C. Remove materials which may have penetrated torn fabric.

D. Log any defects, holes, and tears which are identified and repaired.

3.4 PROTECTION

A. Geotextile shall be stored in such a manner to protect it from puncture, dirt, grease, water, mud, or excessive heat.

END OF SECTION

# SECTION 02229

# TRENCHING, BACKFILLING, AND COMPACTING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes exploratory backhoe trenching, backfilling, and compacting as specified herein.

B. Related sections:

1. Section 02222: Earthfill and Waste Relocation

### 1.2 REFERENCES

A. American Society for Testing and Materials.

1. D 422, Method for Particle-Size Analysis of Soils.

2. D 1557, Test Methods for Laboratory Compaction Characteristics of Soil.

3. D 2487, Standard Test Method for Classification of Soils for Engineering Purposes.

B. Occupational Safety and Health Administration (OSHA).

### 1.3 DEFINITIONS

A. Backfill: Material placed in previously excavated trenches.

B. Cohesionless Materials: Materials classified by the Unified Soil Classification System (USCS) as GW, GP, SW, and SP.

C. Cohesive Materials: Materials classified by USCS as GC, SC, ML, CL, MH, and CH.

D. Construction Quality Assurance (CQA) Consultant: The monitoring firm responsible for implementation of the CQA plan.

E. Lift: One single continuous placements of soils.

F. Soils laboratory: A laboratory capable of conducting the tests required by this specification. Also referred to as the CQA Laboratory.

## PART 2 - PRODUCTS

2.1 GENERAL (Backfill)

A. Sources: Obtained from identified on-site stockpiles.

B. Free of angular, and other deleterious materials.

C. Greater than 30 percent fine material (#200 sieve).

D. Maximum particle size of 4 inches.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the City.

## PART 3 - EXECUTION

3.1 PREPARATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely, safe, and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. Comply with pertinent provisions of the Specifications and Construction Drawings.

3.3 PROCEDURES

A. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

B. Maintain access to adjacent areas at all times.

3.4 TRENCHING

A. Trenching:

1. Excavate trenches.

2. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects,

backfill the voids remaining after removal of the objects as directed by the CQA Monitor.

3. When the void is below the subgrade for the utility bedding, use suitable earth materials and compact to the relative compaction directed by the CQA Monitor, but in no case to a relative compaction less than 90.0 percent of ASTM D 1557.

4. When the void is in the side of the trench or open cut, use suitable soil or sand compacted or consolidated as approved by the CQA Monitor, but in no case to a relative compaction less than 90.0 percent of ASTM D 1557.

5. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the City.

B. Trench to the minimum width necessary for proper installation of the pipe with sides as nearly vertical as possible. Uniformly grade the bottom to provide uniform bearing for the utility.

C. Depressions:

1. Except where rock is encountered, do not excavate below the depth indicated or specified.

2. Where rock is encountered, over excavate rock to a minimum over depth of 4 inches below the trench depth indicated or specified.

## 3.5 BACKFILLING

A. General:

1. Backfill trenches to the ground surface with materials shown on the Construction Drawings.

2. Reopen trenches which have been improperly backfilled. Refill and compact as specified, or otherwise correct to the approval of the Design Engineer.

3. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests, and approvals.

4. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, refill and compact as specified, all at no additional cost to the City.

B. Lower portion of trench:

1. Trench gravel: Take special care in backfilling and bedding operations to not damage pipe and pipe coatings. Place gravel to completely surround pipe without voids. Lightly tamp bedding to compact.

C. Remainder of trench:

1. Except for special materials for drainage trenches, backfill the remainder of the trench with trench backfill material.

2. General earthfill: Deposit trench backfill material in layers not exceeding 8 inches in thickness, and compact each layer to 90.0 percent relative compaction based on ASTM D 1557.

3. Trench gravel: Place gravel in layers not exceeding 12 inches. Lightly tamp to eliminate voids.

3.6 FIELD QUALITY CONTROL

A. The CQA Monitor shall inspect open cuts and trenches before installation of pipes, and will make the following tests:

1. Verify that trenches are not backfilled until all tests have been completed.

2. Check backfilling for proper layer thickness and compaction.

3. Verify that test results conform to the specified requirements, and that sufficient tests are performed.

4. Verify that defective work is removed and properly replaced.

END OF SECTION

# SECTION 02233

# AGGREGATES AND RIP RAP

## PART 1 - GENERAL

### 1.1 SUMMARY

The requirements for drainage layer aggregate, gravel road aggregate, and rip rap are specified herein.

### 1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced in the text. The publications are referenced to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
STANDARD TEST METHODS/PRACTICE

ASTM C 88 Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

ASTM C 131 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM D 75 Sampling Aggregates

ASTM D 422 Particle Size Analysis of Soils

ASTM D 698 Laboratory Compaction Characteristics Soil Using Standard Effort (12,400 ft-lbf/ft$^3$ (600 Kn-m/m$^3$))

ASTM D 1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 2434 Permeability of Granular Soils (Constant Head)

ASTM D 2487 Classification of Soils for Engineering Purposes

ASTM D 2922 Density of Soil and Soil-Aggregate in Place by Nuclear Method (Shallow Depth)

ASTM D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

ASTM D 4253 Maximum Index Density and Unit Weight of Soils Using a Vibratory Table

ASTM D 4254 Minimum Index Density and Unit Weight of Soils Using a Vibratory Table

ASTM D 4373 Calcium Carbonate Content of Soils

ASTM E 11 Wire-Cloth Sieves for Testing Purposes

ASTM E 548 Guide for General Criteria Used for Evaluating Laboratory Competence

1.3 SUBMITTALS

A. Prequalification: Contractor shall submit the material source and required tests for drainage layer and road aggregate to the CQA Officer for approval.

B. Test Reports: The specified test reports shall be submitted to the CQA Monitor.

C. Approval of Material Source: The source of the material to be used for producing aggregates shall be selected not less than thirty (30) days prior to the time the material will be required in the work. Tentative approval of the source will be based on an inspection by the CQA Monitor. Tentative approval of material will be based on tests of samples for the specific job. Final approval of both the source and the material will be based on tests for gradation performed on samples taken from the completed and compacted work.

**PART 2 - PRODUCTS**

2.1 AGGREGATES AND RIP RAP

Aggregates shall consist of clean, sound, durable particles of crushed stone or gravel and screenings. The Contractor shall obtain materials that meet the specifications and can be used to meet the grade and smoothness requirements specified herein, after all compaction and proof-rolling operations have been completed. Slag shall not be used. The aggregate shall be free of silt and clay (as defined by ASTM D 2487), vegetable matter, and other objectionable materials or coatings. The portion retained on the No. 4 sieve shall be known as coarse aggregate; that portion passing through the No. 4 sieve shall be known as fine aggregate.

A. Gradation Requirements: Gradation requirements specified herein shall apply to the completed work. The aggregate shall be graded continuously, well within the limits specified in Table 02233-1, Gradation of Aggregates.

2.2 SOURCE QUALITY CONTROL

Sampling and testing shall be performed by an approved commercial testing laboratory subject to approval by the CQA Monitor. Approval of testing facilities shall be based on compliance with ASTM E 548, and no work requiring testing will be permitted until the facilities have been inspected and approved. The materials shall be tested to establish compliance with the specified requirements. Copies of test results shall be furnished to the Engineer.

A. Sampling: Samples for material gradation tests shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the CQA Monitor.

B. Tests: The following tests shall be performed in conformance with the applicable standards listed.

1. Sieve Analyses: Sieve analyses shall be made in conformance with ASTM D 422.

2. Soundness Test: Soundness shall be tested in conformance with ASTM C 88.

3. Wear Test: Wear tests shall be made according to ASTM C 131.

**PART 3 - EXECUTION**

3.1 EQUIPMENT

A. All equipment and tools used in the performance of the work will be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, as well as meeting the grade controls, thickness control, and smoothness requirements as set forth herein.

3.2 STOCKPILING MATERIAL

A. Prior to stockpiling of material, storage sites shall be cleared and leveled by the Contractor. All materials, including approved material available from excavation and grading, shall be stockpiled in a manner and at locations approved by the CQA Monitor. Aggregates shall be stockpiled on the cleared and leveled areas designated by the CQA Monitor so as to prevent segregation. Materials obtained from different sources shall be stockpiled separately.

3.3 PREPARATION OF UNDERLYING COURSE

A. Prior to constructing the crushed-aggregate course for the road(s), the underlying course shall be cleaned of all foreign substances. At the time of construction of the course, the underlying course shall contain no frozen material. The underlying course shall conform to Section 02222 Earthfill.

3.4 GRADE CONTROL

A. During construction, the lines and grades shall be maintained by the Contractor.

3.5 PLACING

A. Road Base: A woven geotextile shall be placed on the prepared surface of the roadway areas to receive aggregate as shown on the Drawings. The aggregate shall be placed so that it cascades down onto the geotextiles rather than being pushed so that it does not slide across the surface causing slack wrinkles in the geotextile or damage to the roadway subgrade.

B. Rip rap: Rip rap shall be placed in such a manner to provide a uniform layer with larger rock fragments evenly distributed and smaller rock fragments filling the spaces between the larger fragments.

Table 02233-1. Gradation/Testing of Aggregates

| Use | Size | Tests |
|---|---|---|
| Access Road Base | Crushed rock, 3/4 to 1-1/2 inch | C131/D422 |
| Drainage Rock | 4" to 8" rock | C131/D422 |
| Rip rap | Crushed rock fragments,<br>100 lbs 50 lbs 25 lbs<br>50-90% 20-65% 0-35% | C131/D422 |

END OF SECTION

# SECTION 02250

# EROSION CONTROL AND PROTECTION

## PART 1 - GENERAL

### 1.1 DESCRIPTION

A. Scope: The Contractor shall provide sediment and erosion control devices to contain surface drainage from within the construction-site, waste, and storage areas. The CQA Officer may require protection in other areas.

B. General Description: This work shall consist of the application of measures throughout out the life of the project to control erosion and to minimize the siltation of rivers, streams and bay. The measures shall include, but not be limited to, the use of berms, dikes, dams, sediment basins, sediment traps, filters, silt fence, fiber mats, netting, gravel or crushed stone, mulch, grasses, slope drains and other methods approved by City or Soil Conservation District. Erosion and siltation control measures as described herein shall be applied to erodible material exposed by any activity on the project.

C. Related Work Specified Elsewhere:

| | | |
|---|---|---|
| 1. | Section 02221 | Excavating and Grading |
| 2. | Section 02222 | Earth Fill |
| 3. | Section 02233 | Aggregates |
| 4. | Section 02820 | Fertilize and Seeding |

### 1.2 QUALITY ASSURANCE

A. The U.S. Soil Conservation Service handbook of Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas, adopted by the City or Soil Conservation District and the State of California Department of Water Resources is to be used.

### 1.3 PERMITS

A. The Sediment Control Permit will be obtained by the Contractor.

B. The Contractor shall be responsible for obtaining other necessary permits and approvals from the appropriate governmental agencies. Copies of all permits or approvals shall be provided to the CQA Officer prior to starting any work covered by the permits or approvals.

In the event of conflict between these requirements and pollution control laws, rules or regulations of other Federal, State or Local agencies, the more restrictive laws, rules or regulations shall apply.

C. The CQA Officer shall have the right to inspect erosion control measures in off-site borrow pits and waste areas and to report violations of permit requirements to the Merced City agencies.

D. Contractor Compliance:

1. In the event that erosion and pollution control measures are required due to the Contractor's negligence, carelessness or failure to install permanent control as part of the scheduled Work, the CQA Officer may order that Work to be performed by the Contractor at his own expense.

2. Where erosion and sediment control work to be performed is not attributed to the Contractor's negligence, carelessness or failure to install permanent controls and falls within the Specifications for a work item that has a Contract price, the units of work shall be paid for at the proper Contract price.

E. Work Suspension: The Contractor shall comply with the requirements specified herein and as shown on the Drawings. Any violation of these requirements may result in the issuance of a written Notice of Suspension of the Work. The suspension of Work will not be lifted until the Contractor has completely corrected the violation. Time extensions requested as a result of delays occasioned by such suspensions will not be considered.

F. Revisions: Should conditions arise in the field that render the Erosion Control and Protection Plans inadequate or inappropriate for Work included in the Contract, the Contractor shall immediately notify the CQA Officer and the County. Where necessary, additional plans or modifications will be furnished by Merced County and will become a condition of the Erosion Control Permit and the Contract.

1.4 PREPARATION

A. Notification by the Contractor: The Contractor shall notify the City Construction Inspection Division at least 48 hours before commencing work on the project. The site, work materials, plans specifications and permits shall be available on-site at all times during working hours for inspection by the County representatives.

1.5 SUBMITTALS

A. Pre-qualification

Submit the material source, descriptions, and material specifications certified by the supplier to the CQA Officer for approval.

B. Certificate of Compliance: The Contractor shall submit to the CQA Officer for approval at least 14 days before procurement a Certificate of Compliance that the supplied materials meet the specifications herein.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed, sod, mulch, fertilizer, topsoil, soil conditioner and other materials for seed shall be in accordance with Caltrans Specifications – Section 20.

B. Temporary slope drains shall be constructed of material acceptable to the CQA Officer, i.e., pipe, fiber mats, rubble, plastic pipe and plastic sheets.

C. Polyethylene Erosion Control Matting shall be Enkamat type 7010 or other equivalent product as approved by the CQA Officer.

D. Filter Stone shall conform to the 1998 Caltrans Specifications.

E. Other materials as required may be specified by the CQA Officer.

2.2 SILT FENCE

A. Silt fence shall contain net backing for support. Posts shall be galvanized steel or 1-1/2 inch square hardwood. Silt fence shall have the following properties.

| Property | Test Method | Unit | Minimum Average Value |
|---|---|---|---|
| Tensile Strength | ASTM D4632 | Lbs | 120 |
| Water Flow Rate | ASTM D4491 | gal/min/ft$^2$ | 3 |

Silt fence shall be "Mirafi Envirofence" by Mirafi Inc., or equal.

2.3 STRAW BALES

A. Straw bales shall be bound with wire or nylon.

B. Steel rebars or 2" x 2" wooden stakes (two per bale) at least 6 feet long (not on the final landfill cover).

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION REQUIREMENTS

A. Implementation:

1. The Contractor shall implement and comply with all applicable regulation pertaining to erosion and sediment control.

2. No work shall be started until the erosion control schedules and methods of operation have been accepted by the CQA Officer and implemented by the Contractor.

B. Clearing: Clear only those areas that are so designated on the Drawings. Where possible, maintain a vegetative buffer zone between the disturbed working area and any watercourse.

C. Stockpiles: Protect excavated material from being eroded into any waters or onto any adjacent lands. Stockpile excavated material on the high side of excavated areas.

D. Sediment Control: When sediment control devices are designated on the Drawings or by the CQA Officer, install during the initial grading and clearing operations and complete their installation before proceeding with any other site work. Maintain all devices until final restabilization and restoration or otherwise directed by the CQA Officer to remove them.

E. Erosion Control: Provide erosion control measures such as straw bale, earth berm, dike or other diversion devices that will safely convey runoff through disturbed areas to prevent scour or gully erosion. When possible, runoff shall be diverted in a safe manner around disturbed areas using pipes with headwalls and protected outlets.

F. Maintenance and Repairs: All erosion and sediment control devices that are disturbed during the construction operations shall be fully repaired by the end of the day on which they are disturbed. All erosion and sediment control devices shall be maintained for the winter season and during other times when the project is closed down.

G. Critical Areas: Critical areas are disturbed areas with a surface gradient exceeding ten (10) percent and shall be immediately stabilized with vegetation after filling and/or backfilling operations and maintained. Those areas that cannot be planted shall be adequately covered with straw mulch, wood chips, matting or other erosion prevention materials. Those disturbed areas that are less than ten (10) percent in surface gradient shall be considered critical after diverting runoff from critical areas.

H. Stone Entrance: Provide a stone entrance device in accordance with Merced County District Standards and Specifications, at all points of egress onto public thoroughfares.

I. Drainage:

1. The Contractor shall shape the graded area in a manner as to permit the run-off of precipitation and shall construct earth berms along the top edges of embankments to intercept runoff water. Earth berms shall be compacted to the satisfaction of the CQA Officer.

2. Temporary slope drains shall be provided to carry runoff from cuts and embankments. The slope drains may be of flexible or rigid construction, but shall be capable of being readily shortened or extended as the cut or fill advances. Pipe end sections shall be provided at the entrance to temporary slope drains. Where necessary, energy dissipaters shall be provided at the outlet. In all cases, temporary slope drains shall be outletted into either a stabilized area or a sediment control measure.

J. Cut Slopes and Fill Slopes:

Cut slopes and fill slopes shall be dressed, prepared and seeded as the Work progresses in accordance with the following sequence:

1. Slopes with a vertical height of 40 feet or greater shall be seeded in three approximately equal increments of height.

2. Slopes with a vertical height of less than 40 feet, but more than 10 feet, shall be seeded in two approximately equal increments of height.

3. Slopes with a vertical height of 10 feet or less may be seeded in one operation.

K. The dressing, preparing and seeding of slopes shall be performed immediately following the completion of each increment of height stated and immediately following the suspension of grading operations.

L. Work Site: The CQA Officer will limit the area of excavation and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding and other pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make coordination unrealistic, erosion control measures shall be taken immediately. All construction shall be confined to the minimum area necessary to accommodate the Contractor, equipment and work force engaged in his work.

M. Grading Unit: A grading unit is defined as a complete grading spread consisting of earthmovers, hauling units, graders, compactors, etc. Each grading unit will be limited to the amount of surface area of erodible earth material exposed at one time not to exceed 100 acres, unless a larger area is approved by the CQA Officer or specified in this Invitation for Bids/Project Manual. The Contractor shall be prepared to dress and seed behind each grading unit as defined above.

END OF SECTION

# SECTION 02720

# STORM DRAINAGE STRUCTURES, PIPING, AND FITTINGS

## PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope of Work: The work in this Section includes all the labor, materials, equipment and incidentals required to construct storm drainage channels, pipe downchutes, pipe gutters, pipe inlet and outlet structures, rip rap, endwalls, and other drainage structures as shown on the Drawings, specified herein.

B. Related Work Specified Elsewhere:

1. Section 02110 - Site Clearing, Grubbing, And Stripping
2. Section 02221 - Excavation and Grading
3. Section 02222 – Earthfill and Waste Relocation
4. Section 02233- Aggregates
5. Section 03300 - Concrete

C. References:

1. Caltrans Standard Specifications for Construction Materials, October, 1998.

1.2 SUBMITTALS

A. Supplier information and product specifications shall be submitted to the CQA Officer for review and approval at least 30 days before product procurements. The Contractor shall be fully responsible for any construction delays due to failure to obtain submittal approval in a timely manner.

B. Shop Drawings: Shop drawings for the following items shall be submitted for approval at least 15 days before installation.

1. Corrugated High Density Polyethylene (HDPE) downchutes and all related details.
2. HDPE Compression Release Joints.
3. Concrete endwalls, headwalls, and corrugated HDPE pipe to endwall connections.

4. Centerline cross-sections/profiles of basin outfall pipes through basin embankments, depicting embankments, principal spillway structures, headwalls, end walls, pipes, anti-seep collars, rip rap aprons, etc., including vertical elevations and pipe slopes and horizontal locations.

5. Centerline cross-sections/profiles of HDPE, depicting locations of pipes, fittings, risers, headwalls, compression release joints, and rip rap outfalls.

C. Certificate of Compliance for HDPE pipes; pipe cradles, anti-seep collars, valves, HDPE compression release joints, risers, and manhole inlets shall be submitted to the CQA Officer for approval at least 15 days before installation.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Rip Rap: Refer to Section 02233 – Aggregates and Rip Rap.

B. Caltrans Aggregates: Refer to Section 26 - Aggregates.

C. Corrugated HDPE Storm Drain Pipes:

1. Shall be of Class 100 or 63 for ring stiffness constant (RSC) as defined in ASTM F 894-89 - "Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe".

2. Pipe material shall be Type III, Class C, Category 5, Grade P34 according to ASTM D 1248 - "Standard Specification for Polyethylene Plastics Molding and Extrusion Materials".

3. Manufactured by Plexco/Spirolite or approved equal.

4. Joints: Pipes shall be produced with Bell and Spigot end construction. Joints shall be accompanied by rubber gaskets meeting all ASTM F 477 requirements and as shown on the Drawings.

5. Perforations shall be per Manufacturer's standards.

6. Visible defects such as cracks, creases, splits, obstructions to flow in perforations or in tube, uncolored or "pale" tubing, and obvious thin spots are not permissible.

D. HDPE Pipes, Risers, and Fittings: Shall be as shown on the Details and manufactured by Plexco/Spirolite, or approved equal.

E. Gaskets: Rubber gaskets shall comply with all ASTM F 477 requirements and shall have a minimum internal and external hydrostatic pressure rating of 10 psi gage.

F. Lubricants: The lubricant used for assembly shall have no detrimental effect on the gaskets or on the pipes.

G. Compression Release Joints: Compression Release Joint shall be designed and fabricated by the pipe Manufacturer. The Joint shall be capable of withstanding an internal and external hydrostatic pressure of 5 psi gauge. The design of the joint shall be approved by the CQA Officer prior to fabrication.

H. HDPE Pipe Embedments for Concrete Structures: HDPE Embedments shall be a standard product of the pipe manufacturer. Installation and casting of HDPE embedment into concrete structures shall be in accordance with pipe Manufacturer's instructions.

**PART 3 – EXECUTION**

A. Pipe Trenches:

1. Pipe trenches shall be excavated as specified in Section 02229 – Trenching, Backfilling, and compaction.

B. Drainage Structures:

1. Drop inlets shall be constructed in conformity with the Drawings, Section 03300 of these Specifications, and the 1998 Caltrans Specification Road and Bridge Standards. The HDPE pipe to endwall connection shall be per the Drawings, the pipe Manufacturer's standard details and recommendations.

C. Pipe Bedding and Backfilling for Pipes and Drainage Structures:

1. Bedding and backfilling for buried culverts shall comply with the specifications in Section 02229 – Trenching and Backfilling, and Compacting.

2. Backfill for drainage structures shall be placed and compacted in the same manner as specified above the pipe, except the concrete shall be permitted to cure at an outside temperature at or above $50^0$ F for not less than 5 days before the backfill is placed.

D. HDPE Pipes, Fittings, and Accessories Installation:

1. Pipes, fittings and accessories shall be handled in a manner that will ensure installation in sound, undamaged condition. Equipment, tools, and methods used in unloading, storage, reloading, hauling, and laying shall be such that the pipes, risers, fittings and accessories are not damaged. The Contractor shall repair or replace any damaged pipes, fittings and accessories due to mishandling before and during installations at no additional cost to the City.

2. Pipes, fittings and accessories shall be installed in accordance with the Manufacturer's recommendations and with lines and grades and details shown on the Drawings. Manufacturer's recommendations for installation shall be the minimum requirements.

3. Where culvert pipe is to be laid on existing ground and on or under fill the Contractor shall construct the embankment to a height to the top of pipe and then excavate a trench to receive the pipe. Trench shall be no wider than necessary to permit proper compaction of embankment around the pipe.

4. The interior of all pipes, fittings, and accessories shall be thoroughly cleaned of all foreign matter prior to being installed. Before jointing, all joint contact surfaces shall be cleaned, if necessary, and kept clean until jointing is completed.

5. Whenever the pipe laying is discontinued, such as end of workday or weekend, the unfinished work shall be protected from displacement due to caving of the banks, runoff, or other damages.

END OF SECTION

# SECTION 02820

# FERTILIZER AND SEED

## PART 1- GENERAL

1.1 SUMMARY

A. Section included

1. Preparing, fertilizing and seeding the soil mono-cover layer.

B. Related Sections

1. Section 02222 – Earthfill and Waste Relocation

1.2 SUBMITTALS

A. Product data: within 30 days after Contractor has received the City notice to proceed, submit:

1. Complete materials list of items proposed to be provided under this section

2. Complete data on source, size, and quality

3. Sufficient data to demonstrate compliance with the specified requirements

## PART 2- PRODUCTS

2.1 WATER

A. Shall be clear and suitable for agricultural use.

B. Reclaimed water may be used; however, it must be tested by a certified laboratory and found suitable for plant growth before it is applied.

C. If water is obtained at the site, it shall be done so only under permit where facilities are utilized.

2.2 SEED

A. All seeds shall be in conformance with the California State Seed Law of the Department of Food and Agriculture.

B. Each bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test.

C. Seed containers shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained.

D. Prior to seeding at the request of the CQA Officer, the Contractor shall provide a letter of certification, original Association of Official Seed Analysts (AOSA)-certified seed test results, and calculation of PLS content.

E. All legume seed shall be pellet-inoculated as provided in Bulletin AXT-280 of the University of California Cooperative Extension, "Pellet Inoculation of Legume Seed". Inoculant sources shall be species-specific and shall be applied at a rate of 2 pounds of inoculant per one hundred pounds of seed.

F. The seed mixture shall meet the requirements of LM Erosion blend as supplied by Lockwood Seed and Grain, Chowchilla, California, telephone 559-665-5702.

G. Species to be applied at the specified rates as follows:

| | | |
|---|---|---|
| 1. | Common Barley | 40 pounds/acre |
| 2. | Annual Rye | 40 pounds/acre |
| 3. | Crimson Clover | 15 pounds/acre |
| 4. | Rose Clover | 5 pounds/acre |

2.3 FERTILIZER

A. Shall conform to the requirements of the California Food and Agricultural Code.

B. Shall be pelleted or granular form.

C. Shall have a minimum guaranteed analysis of 16-20-0+S (Sulfur).

D. Shall be applied at the rate of 300 pounds per acre.

## PART 3 – EXECUTION

3.1 PREPARATION OF SEEDING AREAS

A. Fertilizer and seed shall be applied to a freshly-graded surface while soil remains friable and weed-free.

B. If seeding area is compacted, loosen top ½ inch of soil to create favorable conditions for germination. Method to be approved by the CQA Officer.

C. Remove soil lumps, ridges, and depressions.

D. Track walk with dozer.

3.2 WEATHER LIMITATIONS

A. Apply during the following months: October and November, unless otherwise approved by the City.

B. Do not apply in wind conditions which would not allow uniform application of seed mix.

C. Apply on soil that is surface moist.

3.3 EQUIPMENT

A. Use a broadcast distribution system for fertilizer and seed.

3.4 PROTECTION

A. Protect hydroseeding area from damage.

B. Repair damaged areas.

END OF SECTION